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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/560,673	04/27/2000	Adam Goldstein	81862.P165	4397
8791	7590	10/20/2004	EXAMINER	
BLAKELY SOKOLOFF TAYLOR & ZAFMAN 12400 WILSHIRE BOULEVARD SEVENTH FLOOR LOS ANGELES, CA 90025-1030			PHILPOTT, JUSTIN M	
			ART UNIT	PAPER NUMBER
			2665	

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/560,673

Applicant(s)

GOLDSTEIN ET AL.

Examiner

Justin M Philpott

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4-24, 29-36 and 38-80 is/are pending in the application.
- 4a) Of the above claim(s) 38-80 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-24 and 29-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 16, 2004 has been entered.

Election/Restrictions

2. Newly submitted claims 38-80 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: newly submitted independent claim 38 recites a port controller and notify ring not included in previously presented independent claims 1, 25, 29 and 37; newly submitted independent claim 47 recites a step of sending not included in the previously presented independent claims 1, 25, 29 and 37; newly submitted independent claim 54 recites steps of requesting, re-collecting and re-ordering not included in the previously presented independent claims 1, 25, 29 and 37; and newly submitted independent claims 60, 70 and 76 each recite a network switch architecture comprising a configuration not disclosed in the previously presented independent claims 1, 25, 29 and 37.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution

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on the merits. Accordingly, claims 38-80 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Allowable Subject Matter

3. The indicated allowable subject matter of claims 12, 15-22, 32 and 33-36 is withdrawn in view of the newly discovered reference(s) to DeLong and Ganmukhi. Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 29-32 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,141,344 to DeLong.

Regarding claim 29, DeLong teaches a method using a network switch (e.g., switch 10 in FIG. 1) having a hybrid switch architecture, the method comprising: distributing packets received from a network connection by one of a plurality of ports (e.g., connections from 16/18 to 22, coupled to ports 0-M and 0-N) of a crossbar switch fabric (e.g., switch fabric 22) to at least two shared-memory switch fabrics (e.g., I/O ASIC 12 and 14); and storing the packets distributed from the ingress crossbar switch fabric (e.g., 22) in a shared buffer memory (e.g.,

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memory, see col. 5, lines 63-64 regarding step 70 of FIG. 4) associated with each shared-memory switch fabric (e.g., 12 and 14) (e.g., see col. 4, line 53 – col. 6, line 17).

Regarding claim 30, DeLong teaches removing header or control information from received packets before distribution (e.g., see col. 4, lines 17-40 regarding data unit header comprising a destination address, and upon the corresponding destination not being identified, flooding the data unit to all ports is performed which inherently comprises removing the specific destination address).

Regarding claim 31, DeLong teaches the crossbar switch (e.g., 22) and shared-memory switch fabrics (e.g., 12/14) are configured to distribute and store, respectively, packets in the shared buffer memory (e.g., see col. 5, lines 63-64 regarding loading a data unit into memory) without reference to the final destination (e.g., see col. 4, line 17 – col. 5, line 59).

Regarding claim 32, DeLong teaches each shared-memory switch fabric (e.g., 12/14) is also configured to send a packet buffer number (e.g., destination address) indicating where a packet is stored in a shared buffer memory (e.g., see col. 5, line 60 – col. 6, line 4 regarding loading a data unit in memory, examining the data unit to determine the destination address, and scanning address cache).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 2, 4-24 and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeLong in view of U.S. Patent No. 5,953,314 to Ganmukhi et al.

Regarding claim 1, DeLong teaches a network switch (e.g., switch 10, see FIG. 1) having a hybrid switching architecture, comprising: at least two shared-memory switching fabrics (e.g., I/O ASIC 12 and 14), each shared-memory switching fabric (e.g., 12 and 14) being configured to store and retrieve packets (e.g., see col. 3, line 65 – col. 4, line 52 regarding facilitating processing of data units); and a crossbar switch fabric (e.g., switch fabric 22), the crossbar switch fabric (e.g., 22) including a plurality of ports (e.g. via connections to 16 and 18 and respective ports 0-M and 0-N), for receiving packets to network connections, and at least two channels (e.g., connections to 12 and 14), each of the channels coupled to one of the shared-memory switch fabrics (e.g., 12 and 14) such that the crossbar switch fabric (e.g., 22) is coupled to every shared-memory switch fabric, the crossbar switch fabric (e.g., 22) configured to couple any one of the ports (e.g., 0-N, 0-M) to any one of the channels to distribute packets from one of the network connections to any one of the shared-memory switch fabrics (e.g., 12 and 14) and to re-collect packets from any one of the shared-memory switch fabrics (e.g., 12 and 14) to one of the network connections (e.g., see col. 3, line 65 – col. 4, line 52 regarding forwarding data units).

However, DeLong may not specifically disclose at least a second crossbar switch fabric is included in the architecture.

Ganmukhi also teaches a network switch (e.g., switch 10, see FIG. 1) having a hybrid switching architecture, and further, teaches providing a second crossbar switch (e.g., switch fabric 18) configured similar to that of a first crossbar switch (e.g., switch fabric 16). The dual crossbar switch teachings of Ganmukhi provide reduced susceptibility to switching failure (e.g.,

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see col. 1, line 14 – col. 2, line 20). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to apply the teachings of Ganmukhi to the switch of DeLong in order to provide a second crossbar switch to reduce susceptibility to switching failure (e.g., see col. 1, line 14 – col. 2, line 20).

Regarding claim 2, DeLong teaches the shared-memory switch fabric (e.g., 12 and 14) is an $N \times N$ shared-memory switch fabric, N being an integer greater than one, and wherein each shared-memory switch fabric includes N inputs for receiving packets (e.g., via send/receive ports 0- N , see FIG. 1) and N outputs for sending packets (e.g., via send/receive ports 0- N) on N channels and wherein at least one channel is coupled to the crossbar switch fabric (e.g., connections from 12 and 14 to 22).

Regarding claims 4-10, DeLong in view of Ganmukhi teaches the switch of claim 1, however, may not specifically disclose specifically m is an integer multiple of two of a total number of $N \times N$ shared-memory switch fabrics, N is 48, n and m are 8 or n is 1, the number of crossbar switch fabrics is 12, the number of shared-memory switch fabrics is 2, the number of channels is 4, aggregate data rate on m channels is greater than on n ports, and $N \times N$ connectivity is greater than $n \times m$. However, it is generally considered to be within the ordinary skill in the art to adjust, vary, select or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value. The burden of showing criticality is on Appellant. In re Mason, 87 F.2d 370, 32 USPQ 242 (CCPA 1937); Marconi Wireless Telegraph Co. v. U.S., 320 U.S. 1, 57 USPQ 471 (1943); In re Schneider, 148 F.2d 108, 65 USPQ 129 (CCPA 1945); In re Aller, 220 F.2d 454, 105 USPQ 233 (CCPA 1955); In re Saether, 492 F.2d 849, 181 USPQ 36 (CCPA 1974); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re

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Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to implement the system of DeLong in view of Ganmukhi using the above parameters or values since it is generally considered to be within the ordinary skill in the art to adjust, vary, select or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value.

Regarding claim 11, Ganmukhi teaches a port controller (e.g., control processor 12/14) coupled to the crossbar switch fabric (e.g., switch fabric 16/18) and configured to retrieve packets from at least one network port (e.g., I/O 24) and to forward packets to the crossbar switch fabric (e.g., 16/18) and configured to receive packets from the crossbar switch fabric (e.g., 16/18) and to forward packets to a destination network component via the at least one network port (e.g., I/O 24) (e.g., see col. 2, line 38 – col. 3, line 52 and col. 5, lines 3-61). As discussed above, the teachings of Ganmukhi provide reduced susceptibility to switching failure (e.g., see col. 1, line 14 – col. 2, line 20). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to apply the teachings of Ganmukhi to the switch of DeLong in order to reduce susceptibility to switching failure (e.g., see col. 1, line 14 – col. 2, line 20).

Regarding claim 12, Ganmukhi teaches a notify ring (e.g., via timing control module 20/22, see FIGS. 1, 2 and 5) coupled to each port controller (e.g., control processor 12/14), the notify ring configured to transfer forwarding information (e.g., interrupts, see col. 6, line 56 – col. 7, line 39) to each port controller (e.g., 12/14), and wherein the forwarding information (e.g., interrupt) is used to request packets from shared-memory switch fabrics (e.g., buffered data via 99, 36, 104 and 106 in FIG. 2) by one of the port controllers (e.g., 12/14) (e.g., see col. 6, line 56 – col. 7, line 39). As discussed above, the dual crossbar switch teachings of Ganmukhi provide

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reduced susceptibility to switching failure (e.g., see col. 1, line 14 – col. 2, line 20). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to apply the teachings of Ganmukhi to the switch of DeLong in order to provide a second crossbar switch to reduce susceptibility to switching failure (e.g., see col. 1, line 14 – col. 2, line 20).

Regarding claims 13 and 14, DeLong teaches the crossbar switch (e.g., 22) and shared-memory switch fabrics (e.g., 12/14) are configured to distribute and store, respectively, packets in the shared buffer memory (e.g., see col. 5, lines 63-64 regarding memory) (e.g., see col. 4, line 17 – col. 5, line 59).

Regarding claim 15, DeLong teaches each shared-memory switch fabric (e.g., 12/14) is also configured to send a packet buffer number (e.g., destination address) indicating where a packet is stored in a shared buffer memory (e.g., see col. 5, line 60 – col. 6, line 4 regarding loading a data unit in memory, examining the data unit to determine the destination address, and scanning address cache).

Regarding claims 16, 17, 33 and 34, DeLong teaches the method of claim 32 as discussed above, and DeLong in view of Ganmukhi teach the switch of claim 1 as discussed above, and further, Ganmukhi teaches generating the forwarding information as discussed above regarding claim 12. Additionally, DeLong teaches data is requested based upon the packet buffer number (e.g., destination address) and a switch instance (e.g., update event) sent from each shared-memory switch fabric (e.g., see col. 4, line 53 – col. 6, line 17 regarding event messaging). As discussed above, the dual crossbar switch teachings of Ganmukhi provide reduced susceptibility to switching failure (e.g., see col. 1, line 14 – col. 2, line 20). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to apply the teachings of Ganmukhi to

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the switch of DeLong in order to provide a second crossbar switch to reduce susceptibility to switching failure (e.g., see col. 1, line 14 – col. 2, line 20).

Regarding claims 18, 21 and 35, DeLong teaches packets are requested in an egress request queue based on an availability of a channel (e.g., see col. 6, line 18 – col. 7, line 25 regarding transmit queues, wherein availability of the channel corresponding to the transmit queue determines data unit transmission).

Further, regarding claims 18, 21 and 35, and also regarding claims 19 and 20, while DeLong and DeLong in view of Ganmukhi may not specifically disclose packets are transmitted in the order of receipt or are re-ordered prior to transmission, Examiner takes official notice that it is well known in the art of packet transmission to transmit packets either in the order of receipt or in a re-ordered arrangement. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to transmit packets in DeLong in view of Ganmukhi either in the order of receipt or in a re-ordered arrangement since it is well known in the art of packet transmission to transmit packets either in the order of receipt or in a re-ordered arrangement.

Regarding claim 22, DeLong teaches an ingress unit (e.g., RX queue 60/62 path, see FIG. 3) configured to receive packets and forward the received packets to channels coupled with the shared-memory switch fabrics; and an egress unit (e.g., TX queue 52/54 path) configured to receive requested packets from the shared-memory switch fabrics and forward the requested packets to a port controller (e.g., arbiter 42) (e.g., see col. 4, line 53 – col. 5, line 60). Further, switching fabric (e.g., 22) implicitly comprises ingress and egress switching in view of bidirectional communications between 22 and 12/14/16/18 (e.g., see FIG. 1).

Regarding claims 23 and 24, Ganmukhi teaches the packets may be data packets for an Ethernet network or data cells for an ATM network (e.g., see col. 2, lines 59-65). As discussed above, the dual crossbar switch teachings of Ganmukhi provide reduced susceptibility to switching failure (e.g., see col. 1, line 14 – col. 2, line 20). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to apply the teachings of Ganmukhi to the switch of DeLong in order to provide a second crossbar switch to reduce susceptibility to switching failure (e.g., see col. 1, line 14 – col. 2, line 20).

8. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeLong.

Regarding claim 36, DeLong teaches the method discussed above regarding claim 30 and further, teaches packets are requested by an egress port controller based on an availability of a channel regardless of the order received by an ingress port controller (e.g., see col. 6, line 18 – col. 7, line 25 regarding transmit and receive queues, wherein availability of the channel corresponding to the transmit and receive queues determines data unit transmission). Further, while DeLong may not specifically disclose packets are transmitted in the order of receipt or are re-ordered prior to transmission, Examiner takes official notice that it is well known in the art of packet transmission to transmit packets either in the order of receipt or in a re-ordered arrangement. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to transmit packets in DeLong either in the order of receipt or in a re-ordered arrangement since it is well known in the art of packet transmission to transmit packets either in the order of receipt or in a re-ordered arrangement.

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Conclusion

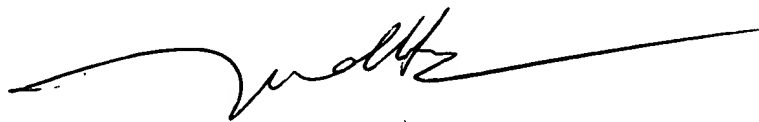
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin M Philpott whose telephone number is 571.272.3162. The examiner can normally be reached on M-F, 9:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy D Vu can be reached on 571.272.3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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